Honeywell

High Temperature Quad Analog Switch HT1204

The HT1204 monolithic quad analog switch consists of four independently controlled switches capable of switching either analog or digital signals over an extremely wide temperature range. It is fabricated with Honeywell's dielectrically isolated high temperature HTMOS[™] linear process, and is designed specifically for use in systems operating in sever high temperature environments. All parts are burned in at 250°C.



These switches provide guaranteed performance over the full -55 to

+225°C temperature range. Typically, parts will operate up to +300°C for a year, with derated performance. High temperature applications such as signal gating, chopping, modulation, demodulation, and multiplexing are all possible with the HT1204.

APPLICATIONS

- Down-Hole Oil Well
- Turbine Engine Control
- Avionics
- Industrial Process Control
- Nuclear Reactor
- Electric Power Conversion
- > Heavy Duty Internal Combustion Engine

FEATURES

- Specified Over -55 to +225°C
- ▶ Worst Case Leakage 500nA at 225°C
- Low Control Input Current
- High Degree of Linearity
- Low Crosstalk Between Switches

- Hermetic 14-Lead Ceramic DIP
- Latch-up Free Design with Dielectric Isolation
- Individual Switch Controls
- CMOS Logic Levels

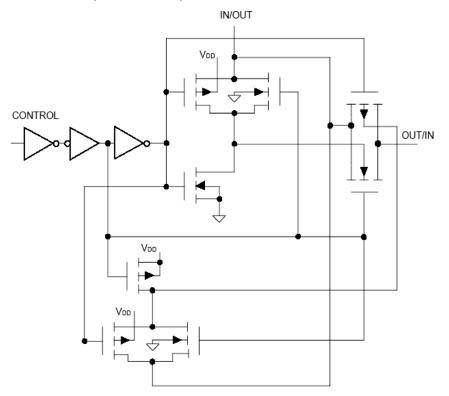
ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Conditions ⁽¹⁾	Тур	Min	Max	Units
V _{DD}	Supply Voltage			5.0	11	V
I _{DD}	Supply Current		1		5	μA
V _A	Analog Voltage Range			V _{SS}	V _{DD}	
I,	Control Input Current ⁽²⁾				±1	μA
V _{IH}	High Level Input Voltage			$0.6 \times V_{DD}$		V
V _{IL}	Low Level Input Voltage				$0.4 \text{ x V}_{\text{DD}}$	V
R _{ON}	ON Resistance	I_{S} = 1mA, V_{A} = V_{SS} to V_{DD}			100	Ω
ΔR_{ON}	ON Resistance Matching	$I_{S} = 1mA$, $V_{A} = V_{SS}$ to V_{DD}			15	Ω
I _{L(ON)}	ON Leakage Current	$V_A = V_{SS}$ to V_{DD}		-Vs	+Vs -2.2	nA
I _{L(OFF)}	Open Loop Gain	$V_A = V_{SS}$ to V_{DD}	115	100		nA
CI	Input Capacitance ⁽³⁾					рF
C_{F}	Feedthrough Capacitance ⁽³⁾					рF
T _{PD}	Propagation Delay	$C_L = 50 pF$				ns
T _{ON}	Switch Turn-on Time (T _{PHZ'} T _{PZL})	$C_L = 50 pF_1 R_L = 1 K \Omega$	(4)		100	ns
T _{OFF}	Switch Turn-off Time (T _{PHZ} T _{PLZ})	$C_L = 50 pF_1 R_L = 1 K\Omega$	(4)		200	ns

Specifications apply for 0-10V ± 10% from -55 to +225°C.
Rating for a single control pin of the quad.
These parameters are guaranteed by design and not tested on each device.

(4) See graphs.

SIMPLIFIED SCHEDMATIC (one switch)

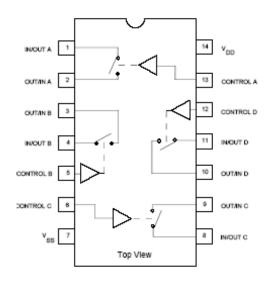


ABSOLUTE MAXIMUM RATING⁽¹⁾

Total Supply Voltage (V+ to V-)	13V
Input Voltage	0.5 to V _{DD} +0.5V
Output Short Circuit Duration	Continuous
Input Current (each input)	±5 mA
Output Current (each output)	±50 mA
Storage Temperature	65 to +325°C
Lead Temperature (attachment, 10 sec)	355°C

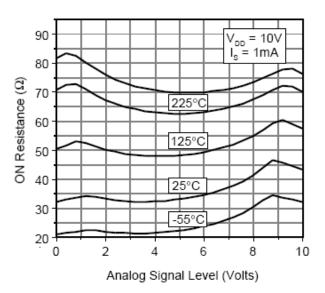
(1) Stresses in excess of those listed above may result in permanent damage. These are stress ratings only, and operation at these levels is not implied. Frequent or extended exposure to absolute maximum conditions may affect device reliability.

PACKAGE PINOUT

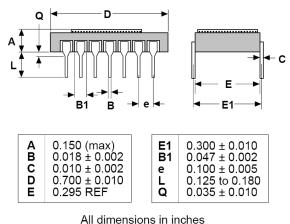


14-Lead Cerdip θjc = 9°C/W

"ON" RESISTANCE vs. ANALOG SIGNAL LEVEL and TEMPERATURE

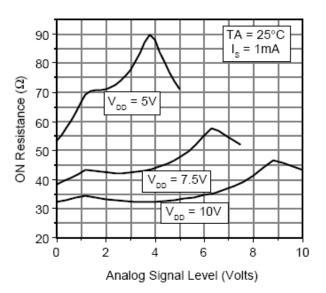


PACKAGE DETAIL



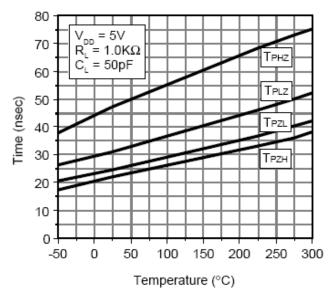
Leads are Gold Plated Nickel

"ON" RESISTANCE vs. ANALOG SIGNAL LEVEL and POWER SUPPLY VOLTAGE

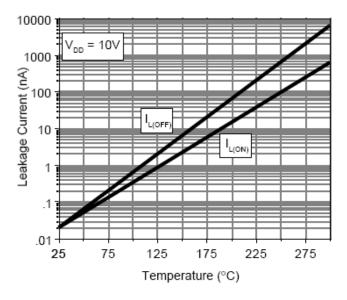


SWITCHING TIME vs. TEMPERATURE 80 V_{DD} = 10V R_L = 1.0KΩ C_L = 50pF 70 60 Time (nsec) 50 Трнг 40 Tplz 30 Tpzl 20 Тргн 10 0 -50 0 50 100 150 200 250 300 Temperature (°C)

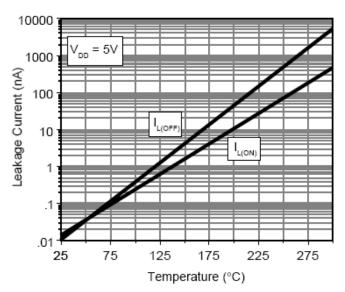
SWITCHING TIME vs. TEMPERATURE



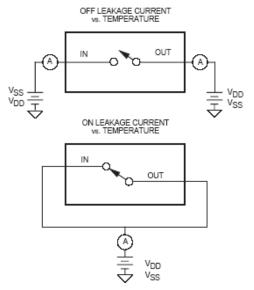
LEAKAGE vs. TEMPERATURE



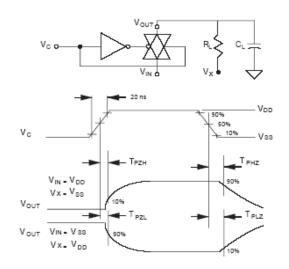
LEAKAGE vs. TEMPERATURE



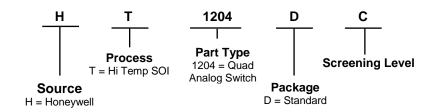
LEAKAGE CURRENT TEST CIRCUITS



TIMING TEST CIRCUIT and WAVEFORMS



ORDERING INFORMATION



Find out more

For more information on Honeywell's High Temperature Electronics visit us online at <u>www.hightempsolutions.com</u> or contact us at 1-800-323-8295. Customer Service Email: <u>ps.customer.support@honeywell.com</u>.

Honeywell reserves the right to make changes to improve reliability, function or design. Honeywell does not assume any liability arising out of the application or use of any product or circuit described herein; neither does it convey any license under its patent rights nor the rights of others.



Form #900134 April 2011 ©2011 Honeywell International Inc.